EXPEDITED PROCEDURE
REPLY UNDER 37 C.F.R 1.116
GROUP ART UNIT 1733

Docket No.: 28748/37575
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Stephen R. Schmidt

Application No.: 09/961,126

Art Unit: 1733

Filed: September 21, 2001

Examiner: Gladys Josefina Piazza Corcoran

For: APPARATUS AND METHOD FOR MANUFACTURING CORRUGATED BOARDS

DECLARATION OF STEPHEN R. SCHMIDT UNDER 37 C.F.R. 1.131

MS AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Stephen R. Schmidt, declare as follows:

1. I am the sole inventor of the subject matter disclosed in the above-referenced patent application.

2. I have reviewed the final office action issued by the U.S. Patent and Trademark Office on September 3, 2004, as well as the prior art cited by the Examiner therein.

3. I am President of Copar Corporation, a leader in the corrugated paper technology, and assignee of many U.S. Patents, including U.S. Patent Nos. 5,676,790; 4,516,702; 4,389,971; 4,389,969; and 4,369,080.

4. I have been involved in the corrugated paper industry for over 35 years and have never seen a similar device as is pending in the above-referenced patent application.

5. In regard to the Swift patent, it mentions spraying an aqueous solution of sodium silicate to the formed medium web. The stated purpose of the spray is to reinforce the strength of the medium. The spray appears to be perpendicular to the single face web. Depending on the distance from the spray device in the medium, the spray would, I agree, tend to apply more spray to the flute tip than to the balance of the medium. However, I have tried to spray a silicate solution, as noted, in an actual paper mill and have found that spraying silicate is impractical. Due to the nature of the material, the spraying device is rapidly covered with a hard coating of a "water glass" which is extremely difficult to remove. Accordingly, silicate solutions are now normally roll coated with a rotary sponge, or other coating method, and before the medium is corrugated.

6. I have also seen wax (for water resistance) applied in the same way or cascaded on to the finished material in a direction parallel to the flutes.

7. The Wallick patents again refer to spraying a coating onto the formed medium web. This coating is also designed to increase the stacking strength of the paper by reinforcing the fiber. It is stated that the starch will cover the application flute tips to prevent the contamination of the liner with the sprayed material. From what I can see, the spray must, by nature, coat the entire surface of the medium, and as such, does not parallel the proposed disclosure. Again, this device is impractical because the spray would coat the corrugating rolls as well as the medium. The coating would thus prevent proper machine operation and damage the machine.

8. As a result of these teachings and others, it is clear that the modern corrugating industry is still in need of improvements. This is particularly so do to a number of current changes, not the least of which is that modern corrugators can and do run faster. That is to say, they have greater capacity to supply heat to cure

the applied adhesive in the shorter time required for high speed. In addition, there is an economic need to improve production.

9. Another difference is that modern corrugating rolls have to be made larger in diameter in order to provide sufficient strength at high speed. Steam temperature and flow rates have also increased. These factors combine to mean that the medium and applied starch are subjected to more heat during the corrugating process.

10. There is also an increasing demand for improved stacking strengths with reduced paper fiber content for reasons of economy and ecology. Paper mills have responded by utilizing a new high ring crush paper technology which produces a stronger and denser paper. Due to the relative absence of insulating voids, this denser paper also heats faster on the corrugators. This fast response to heating makes controlled heat and adhesive application more critical.

11. It is possible to adjust the heat applied to the paper prior to its entering the single facer by adding or removing contact with a heated drum. It is proven to be impossible to adjust the heat applied once the medium has reached the corrugating roll. Likewise, the heat applied at the entrance to the double backer is difficult to regulate.

12. Another complication is that machine operating crews have had difficultly in obtaining proper results using the high speed machines with the new dense papers.

13. As a consequence of all this, it is common practice to increase the amount of adhesive applied as the machine slows down. This extra adhesive tends to quench the heat applied, making the process more forgiving.

14. However, I have noticed that this extra adhesive is not required to provide a bond between the medium and the linear. It is clear that a proper bond is formed at higher speeds using less adhesive.

15. Moreover, extra adhesive results in quality problems as well as increased costs for the adhesive. For example, the liner paper is pulled in to conform with the flute tip as the extra adhesive cures. This results in a defect in the surface of the finished corrugated sheet known as "washboarding" due to its resemblance to the surface of an old style laundry device. Washboarding reduces board strength and also results in a surface which is difficult to print upon. Any attempt at printing using techniques to avoid crushing the board so that stacking strength is maintained results in a "barred" appearance. This printing defect is often commercially acceptable.

16. However, with the teaching afforded by my pending application, this washboarding can be avoided and in fact higher maximum speed machines can be designed, by a voiding this application of extra adhesive.

17. More specifically, the pending device reduces the requirement to add extra starch when running slower with dense papers. Instead of adding more of the standard slurry of starch and water, the new device adds only water first. The heat control offered by the added water then reduces or eliminates the need for additional starch.

18. In addition, the pending device allows the corrugating machines to reach higher speeds by "quenching" the extra heat incrementally when the machine speed is reduced.

19. To summarize, water is added to the flute tip prior to the application of the starch. The amount of water applied is reduced or eliminated as needed independently of the starch slurry application. This approach, to my knowledge, is entirely novel. It is the direct result of changes made in the corrugated industry in the last 10 to 15 years which I studied to arrive at the pending subject matter as set forth in the current claims. Moreover, none of the cited art even suggests this excessive heat is a problem, much less does it identify the solution I have conceived.

20. In light of all the foregoing, I respectfully submit that the pending application includes novel and non-obvious subject matter.

Dated: November 30, 2004

DECLARED,

By _____
Stephen R. Schmidt